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**United States Patent** [19][11] **Patent Number:** **5,260,095****Affinito**[45] **Date of Patent:** **Nov. 9, 1993**[54] **VACUUM DEPOSITION AND CURING OF LIQUID MONOMERS**[75] **Inventor:** **John D. Affinito**, Richland, Wash.[73] **Assignee:** **Battelle Memorial Institute**,  
Richland, Wash.[21] **Appl. No.:** **933,447**[22] **Filed:** **Aug. 21, 1992**[51] **Int. Cl.<sup>5</sup>** ..... **C23C 26/00**[52] **U.S. Cl.** ..... **427/124; 427/294**[58] **Field of Search** ..... **427/124, 255.5, 255.6,**  
**427/294, 428**[56] **References Cited****U.S. PATENT DOCUMENTS**

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The present invention is the formation of solid polymer layers under vacuum. More specifically, the present invention is the use of "standard" polymer layer-making equipment that is generally used in an atmospheric environment in a vacuum, and degassing the monomer material prior to injection into the vacuum. Additional layers of polymer or metal may be vacuum deposited onto solid polymer layers.

Formation of polymer layers under a vacuum improves material and surface characteristics, and subsequent quality of bonding to additional layers. Further advantages include use of less to no photoinitiator for curing, faster curing, fewer impurities in the polymer electrolyte, as well as improvement in material properties including no trapped gas resulting in greater density, and reduced monomer wetting angle that facilitates spreading of the monomer and provides a smoother finished surface.

**6 Claims, No Drawings**